

Notice of Allowability

Application No.

10/804,061

Examiner

Tuyen Q. Tra

Applicant(s)

AOKI ET AL.

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 09/29/2005.
2. ☒ The allowed claim(s) is/are 1-25.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Reason For Allowance

1. Claims 1-25 are allowed.
2. Following is an examiner's statement of reasons for allowance:

The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the independent claim(s), in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims 1, 5, 12, 14, 16, 21, 23 and 25, which include (claim 1) a clad layer disposed on both sides of the core layer containing photonic crystals formed by ferroelectric members made of a ferroelectric substance and periodically disposed along a one-dimensional direction or two-dimensional directions, wherein an effective refractive index of the clad layer is smaller than an effective refractive index of the core layer.; (claim 5) a clad layer disposed on both sides of the core layer and sandwiching the core layer, an effective refractive index of the clad layer being smaller than an effective refractive index of the core layer; the clad layer contains photonic crystals formed by ferroelectric members made of a ferroelectric substance and periodically disposed along a one-dimensional direction or two-dimensional directions; (claim 12) a first optical filter; and a second optical filter upon which a laser beam transmitted through the first optical filter becomes incident, wherein each of the first and second optical filters comprises: a core layer containing photonic crystals formed by ferroelectric members made of a ferroelectric substance and periodically disposed along a one-dimensional direction or two-dimensional

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directions; and electrodes for applying an electric field to the core layer, and wherein band gaps of the photonic crystals of the first and second optical filters are apart from each other by a wavelength interval; (claim 14) a laser oscillator for radiating a laser beam having wavelength distributed in a range from a first wavelength to a second wavelength; a first optical filter upon which the laser beam radiated from the laser oscillator becomes incident; and a second optical filter upon which a laser beam transmitted through the first optical filter becomes incident, wherein each of the first and second optical filters comprises: a core layer containing photonic crystals formed by ferroelectric members made of a ferroelectric substance and periodically disposed along a one-dimensional direction or two-dimensional directions; and electrodes for applying an electric field to the core layer, and wherein band gaps of the photonic crystals of the first and second optical filters are apart from each others by a wavelength interval and partially overlap the range between the first wavelength and the second wavelength; (claim 16) a clad layer disposed on both sides of the core layer containing photonic crystals formed by ferroelectric members made of a ferroelectric substance and periodically disposed along a one-dimensional direction or two-dimensional directions, wherein an effective refractive index of the clad layer is smaller than an effective refractive index of the core layer. (claim 21) a first optical filter; and a second optical filter upon which a laser beam transmitted through the first optical filter becomes incident, wherein each of the first and second optical filters comprises: a core layer including a first member disposed periodically along a one-dimensional direction or two-dimensional directions and a second member filled in between the first members, the

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first and second members constituting a photonic crystal, and at least one of the first and second members being made of a substance having a character that a refractive index is changed upon generation of an electric field; and electrodes for applying an electric field to the core layer, and wherein band gaps of the photonic crystals of the first and second optical filters are apart from each other by a wavelength interval; (claim 23) a laser oscillator for radiating a laser beam having wavelengths distributed in a range from a first wavelength to a second wavelength; a first optical filter upon which the laser beam radiated from the laser oscillator becomes incident; and a second optical filter upon which a laser beam transmitted through the first optical filter becomes incident, wherein each of the first and second optical filters comprises: a core layer including a first member disposed periodically along a one-dimensional direction or two-dimensional directions and a second member filled in between the first members, the first and second members constituting a photonic crystal, and at least one of the first and second members being made of a substance having a character that a refractive index is changed upon generation of an electric field; and electrodes for applying an electric field to the core layer, and wherein, band gaps of the photonic crystals of the first and second optical filters are apart from each other by a wavelength interval and partially overlap the range between the first wavelength and the second wavelength; (claim 25) forming a resist film on a substrate; forming openings in the resist film, the openings being disposed periodically along a one-dimensional direction or two-dimensional directions; filling precursor solution of a ferroelectric substance in the

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openings and drying the solution to form precursors; removing the resist film; and baking the precursors to form ferroelectric members

3. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

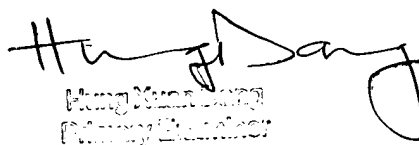
Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyen Tra whose telephone number is (571) 272-2343. The examiner can normally be reached on Monday to Thursday from 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky L Mark, can be reached on (571) 272 - 2333. The fax number for this Group is (571) 273-8300.

TT

December 4, 2005


Hung Vuong
Primary Examiner